Appl'n No.: 10/675,583
Title: Directional Antenna Physical...
Inventors: John E. Hoffmann, *et al.*
Replacement Sheet

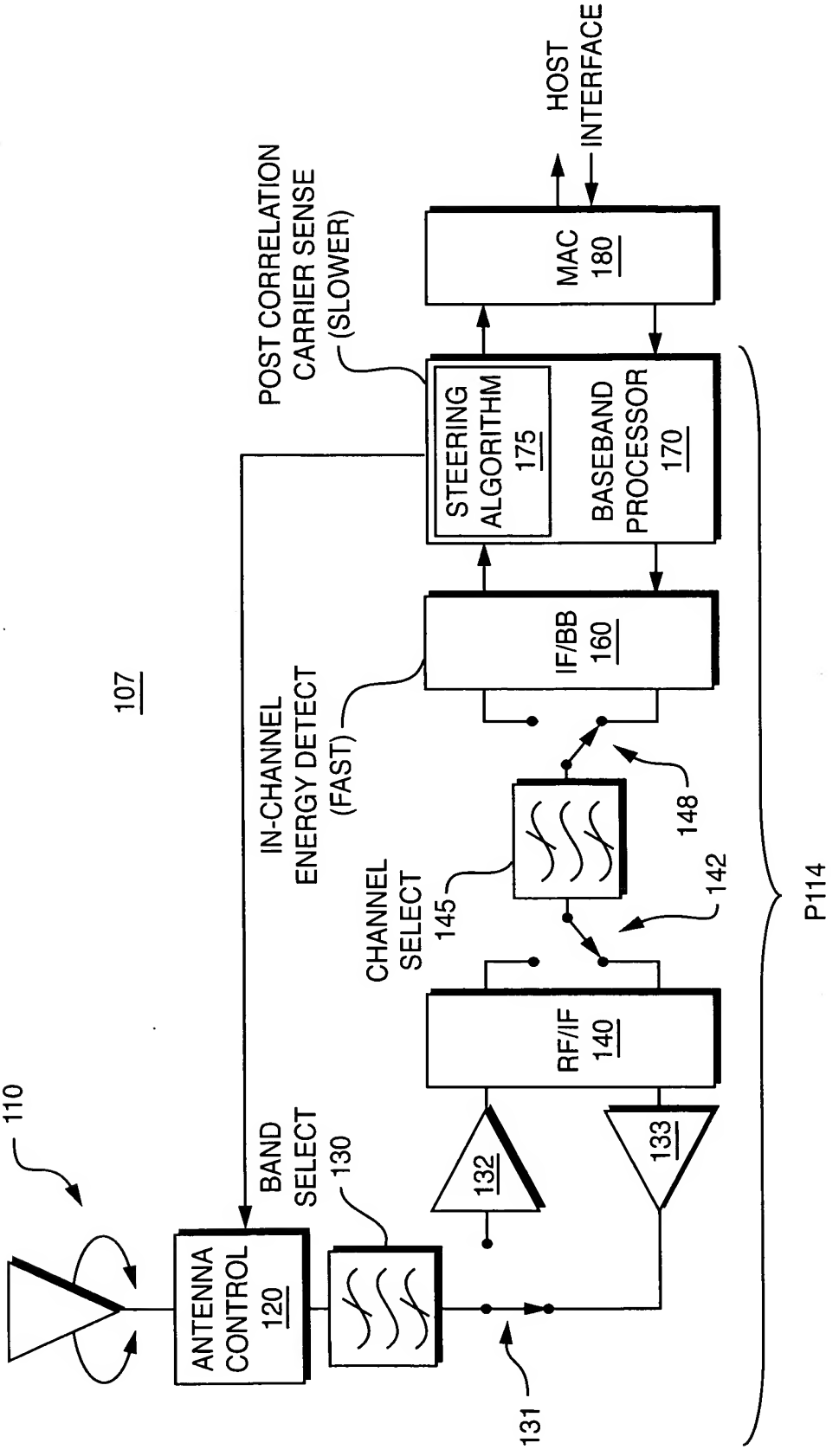

FIG. 1

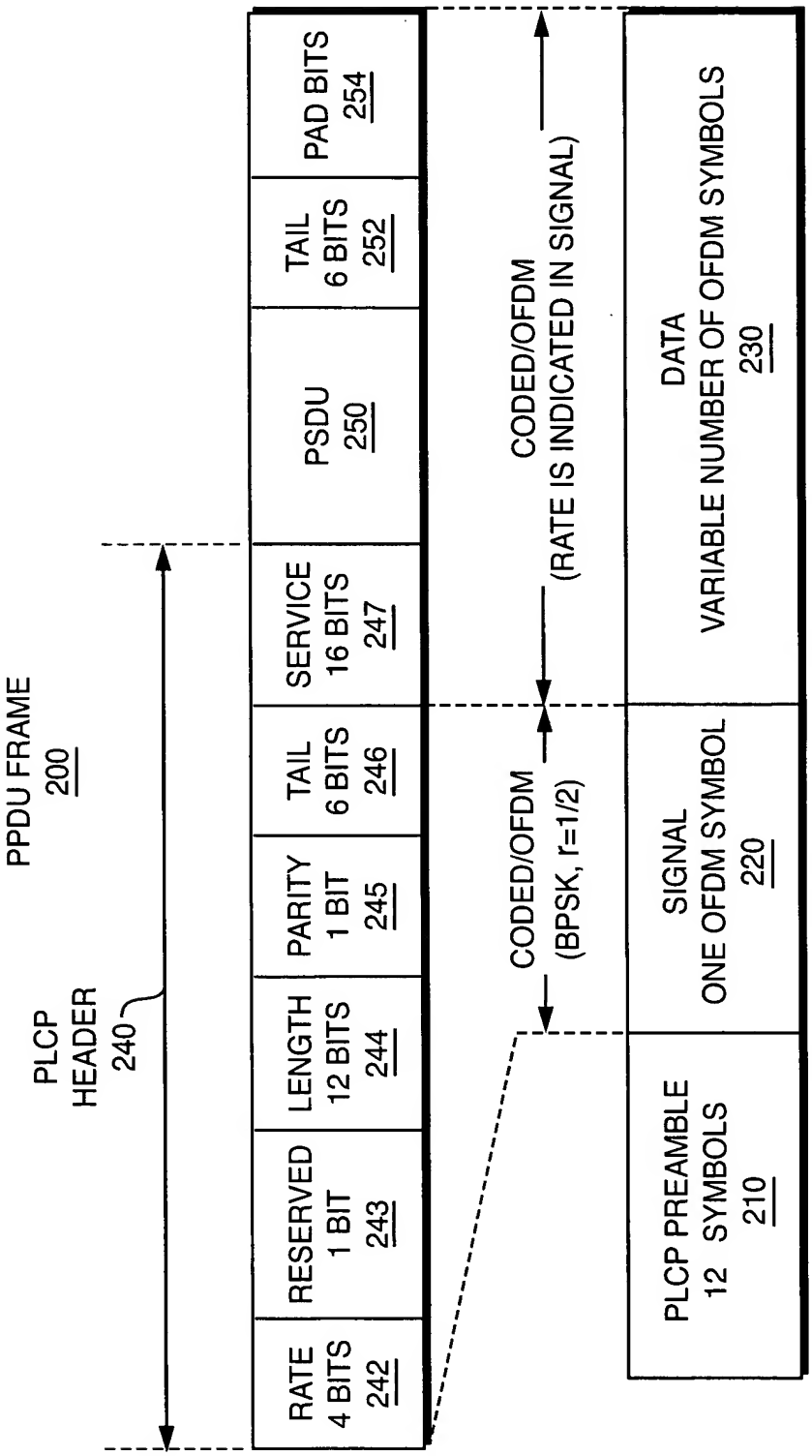
PPDU FRAME
200
PLCP
HEADER
240
RATE
4 BITS
242
RESERVED
1 BIT
243
LENGTH
12 BITS
244
PARITY
1 BIT
245
TAIL
6 BITS
246
SERVICE
16 BITS
247
PSDU
250
TAIL
6 BITS
252
PAD BITS
254
CODED/OFDM
(BPSK, r=1/2)
CODED/OFDM
(RATE IS INDICATED IN SIGNAL)
PLCP PREAMBLE
12 SYMBOLS
210
SIGNAL
ONE OFDM SYMBOL
220
DATA
VARIABLE NUMBER OF OFDM SYMBOLS
230

FIG. 2

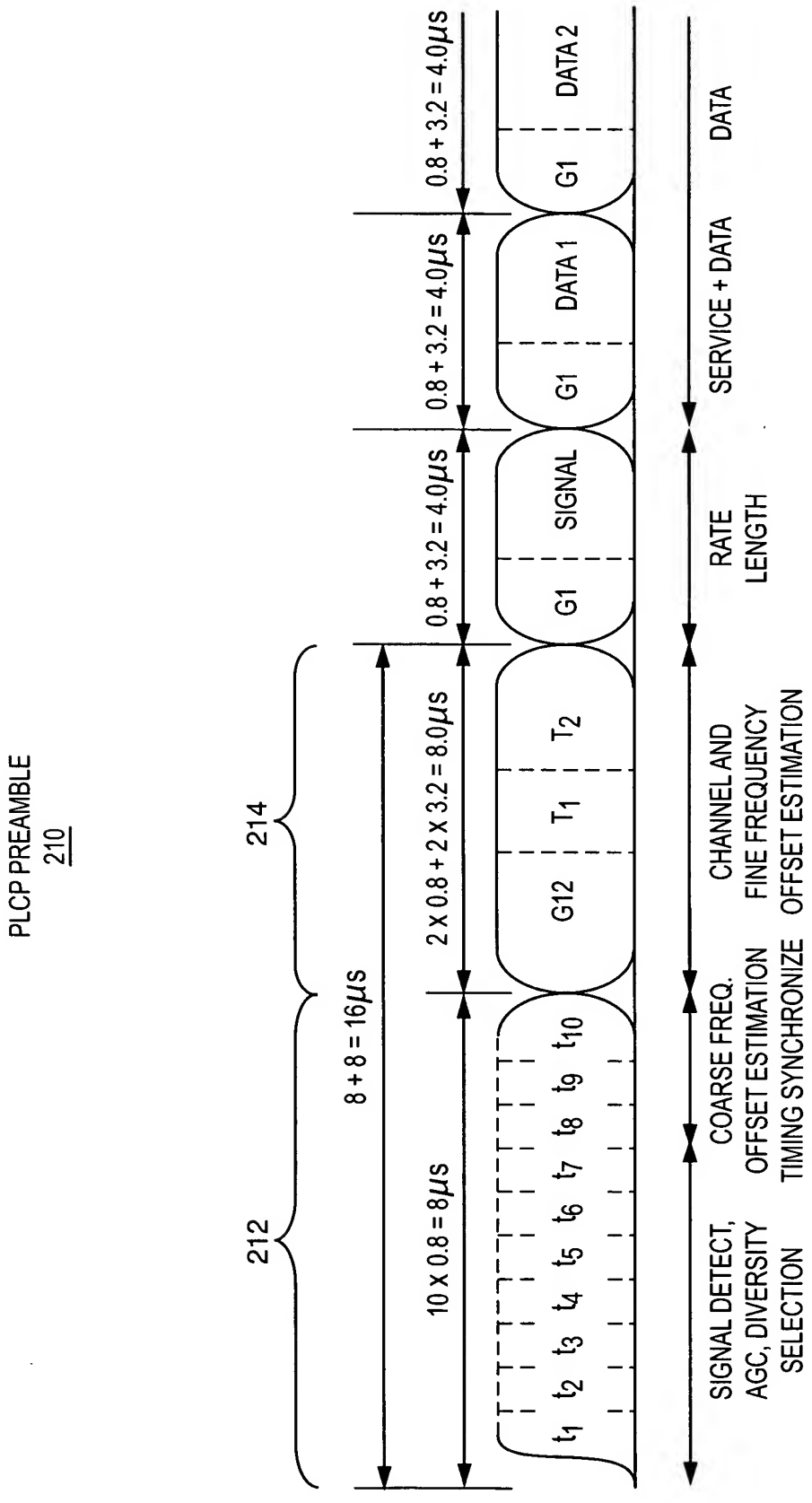
PLCP PREAMBLE
210
212
214
8 + 8 = 16μs
10 X 0.8 = 8μs
2 X 0.8 + 2 X 3.2 = 8.0μs
0.8 + 3.2 = 4.0μs
0.8 + 3.2 = 4.0μs
0.8 + 3.2 = 4.0μs
0.8 + 3.2 = 4.0μs
t1 t2 t3 t4 t5 t6 t7 t8 t9 t10
G12
T1
T2
G1
SIGNAL
G1
DATA 1
G1
DATA 2
SIGNAL DETECT, AGC, DIVERSITY SELECTION
COARSE FREQ. OFFSET ESTIMATION TIMING SYNCHRONIZE
CHANNEL AND FINE FREQUENCY OFFSET ESTIMATION
RATE
LENGTH
SERVICE + DATA
DATA

FIG. 3

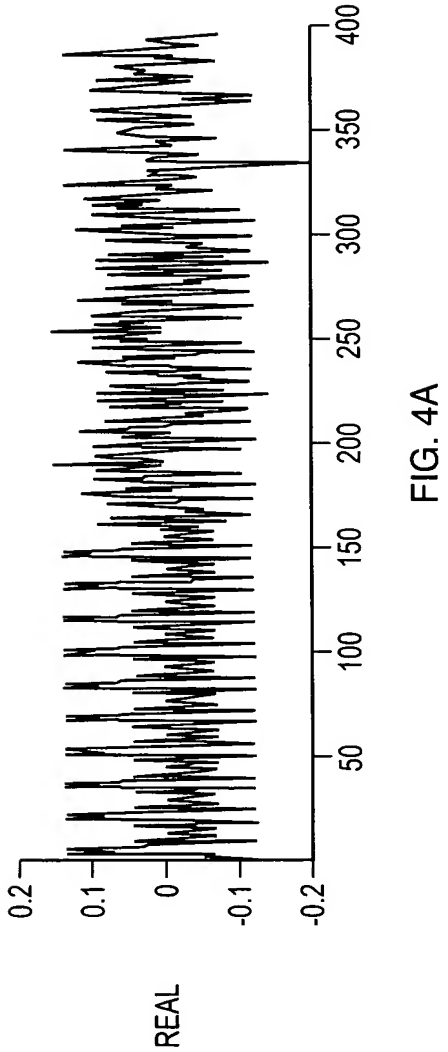
REAL
0.2
0.1
0
-0.1
-0.2
50
100
150
200
250
300
350
400

FIG. 4A

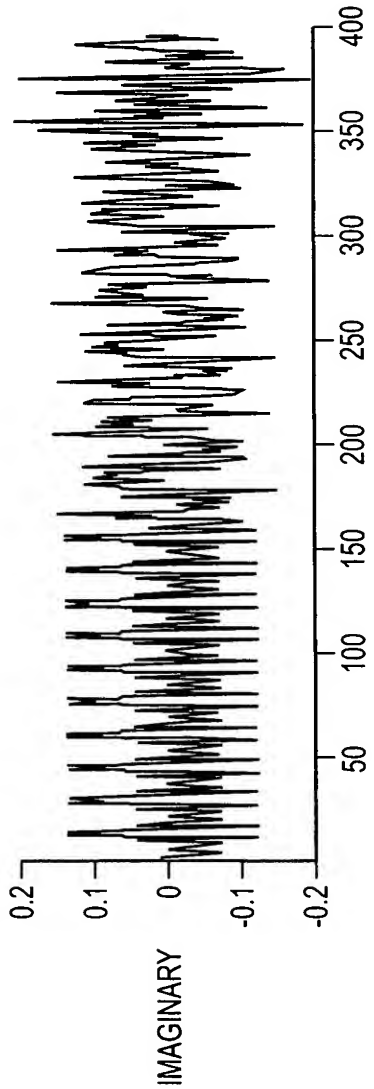
IMAGINARY
0.2
0.1
0
-0.1
-0.2
50
100
150
200
250
300
350
400

FIG. 4B

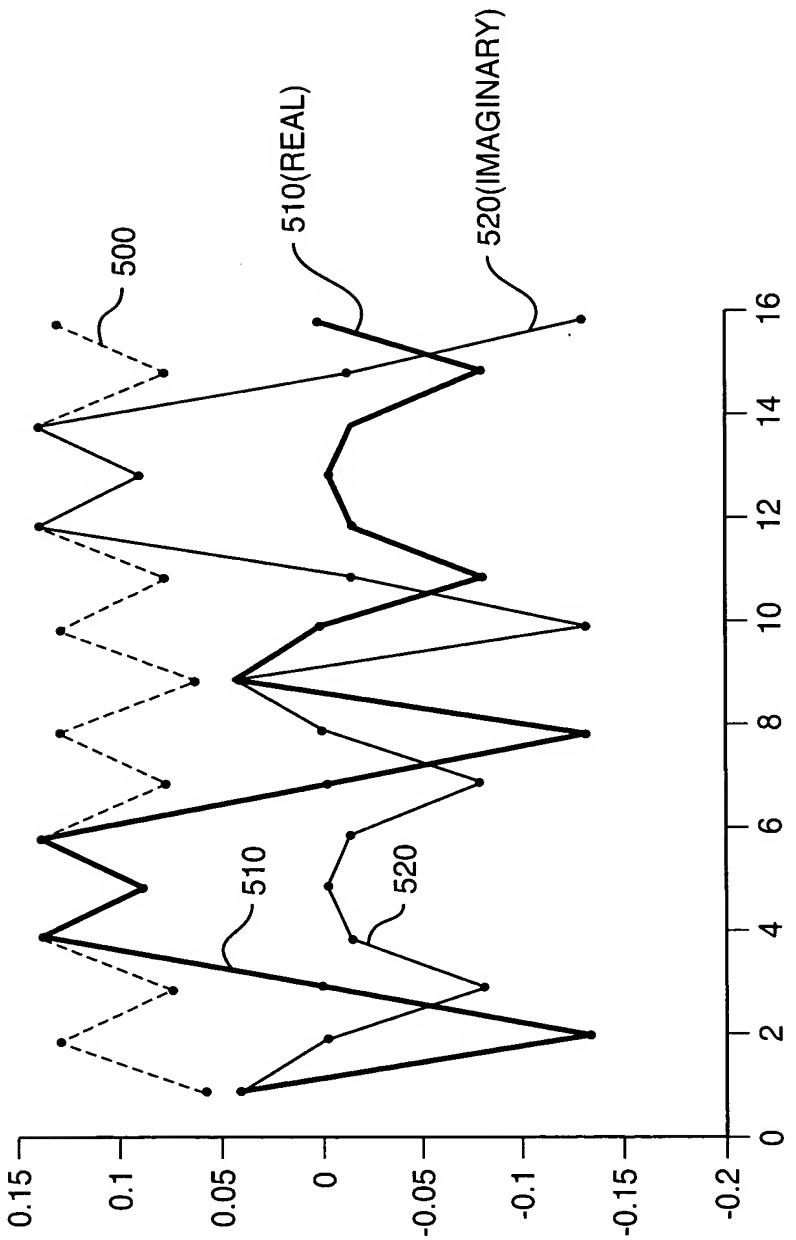
500
510(REAL)
520(IMAGINARY)
510
520
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
0
2
4
6
8
10
12
14
16

FIG. 5

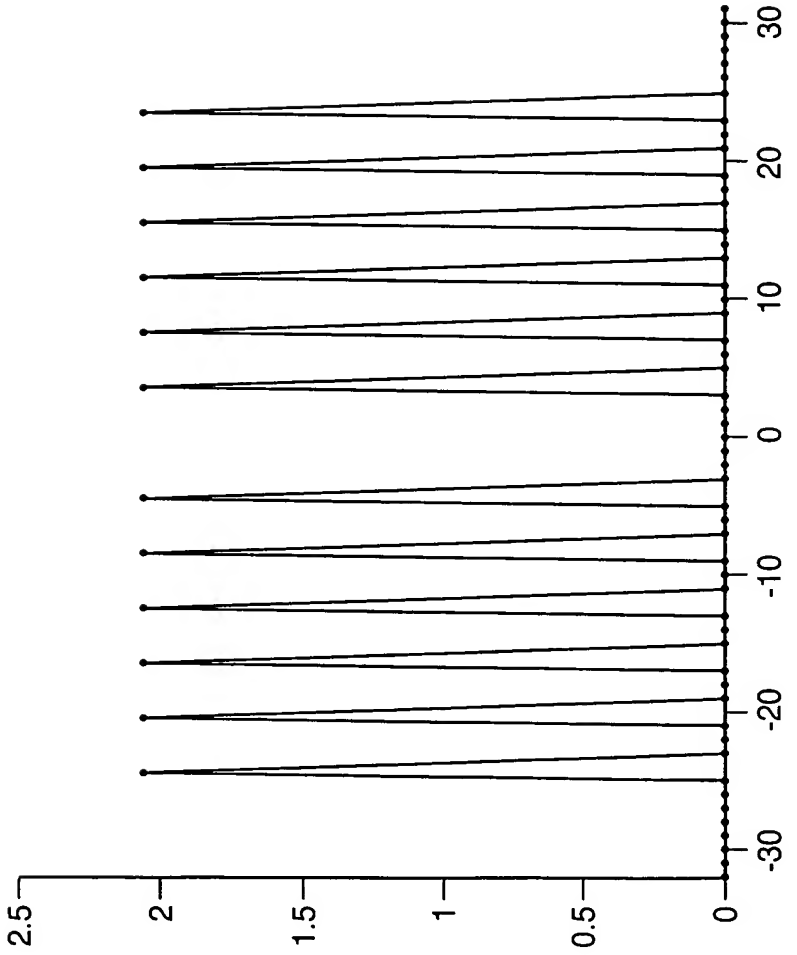

FIG. 6

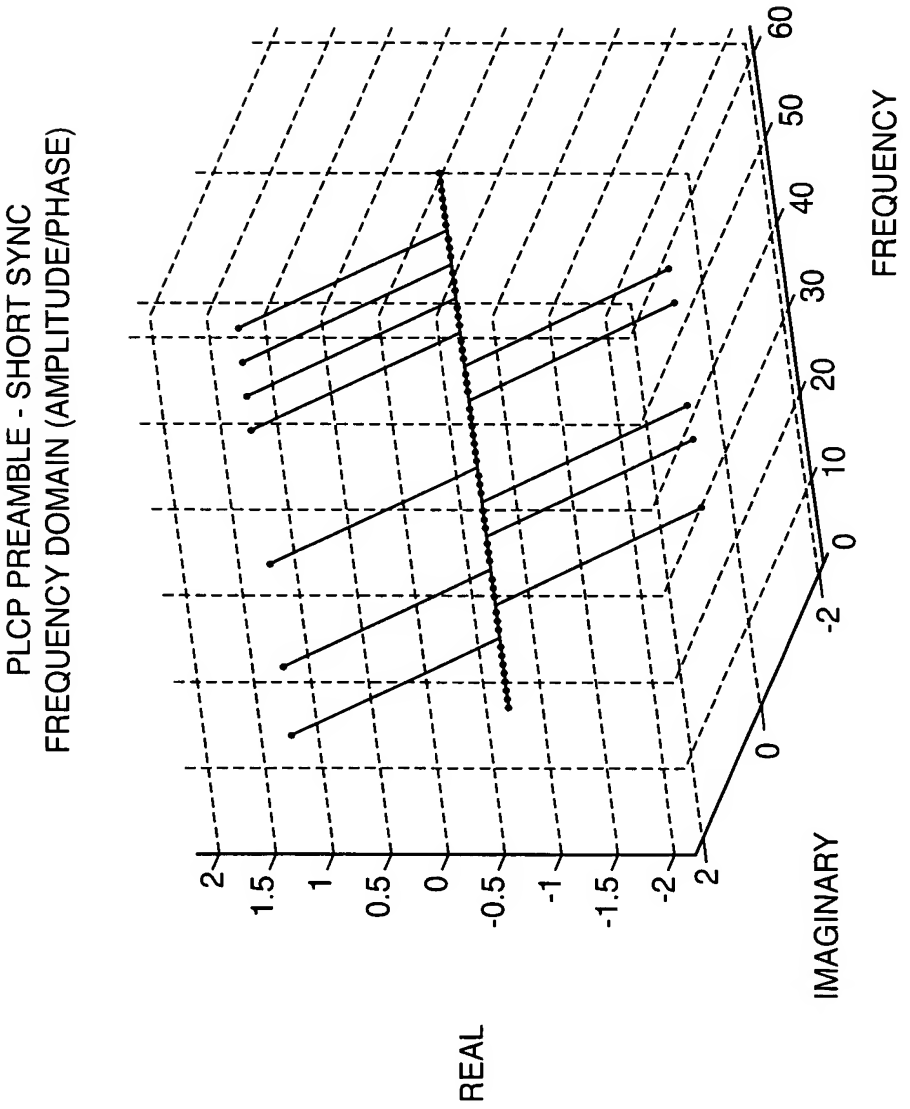
PLCP PREAMBLE - SHORT SYNC
FREQUENCY DOMAIN (AMPLITUDE/PHASE)
REAL
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
IMAGINARY
2
0
-2
FREQUENCY
0
10
20
30
40
50
60

FIG. 7

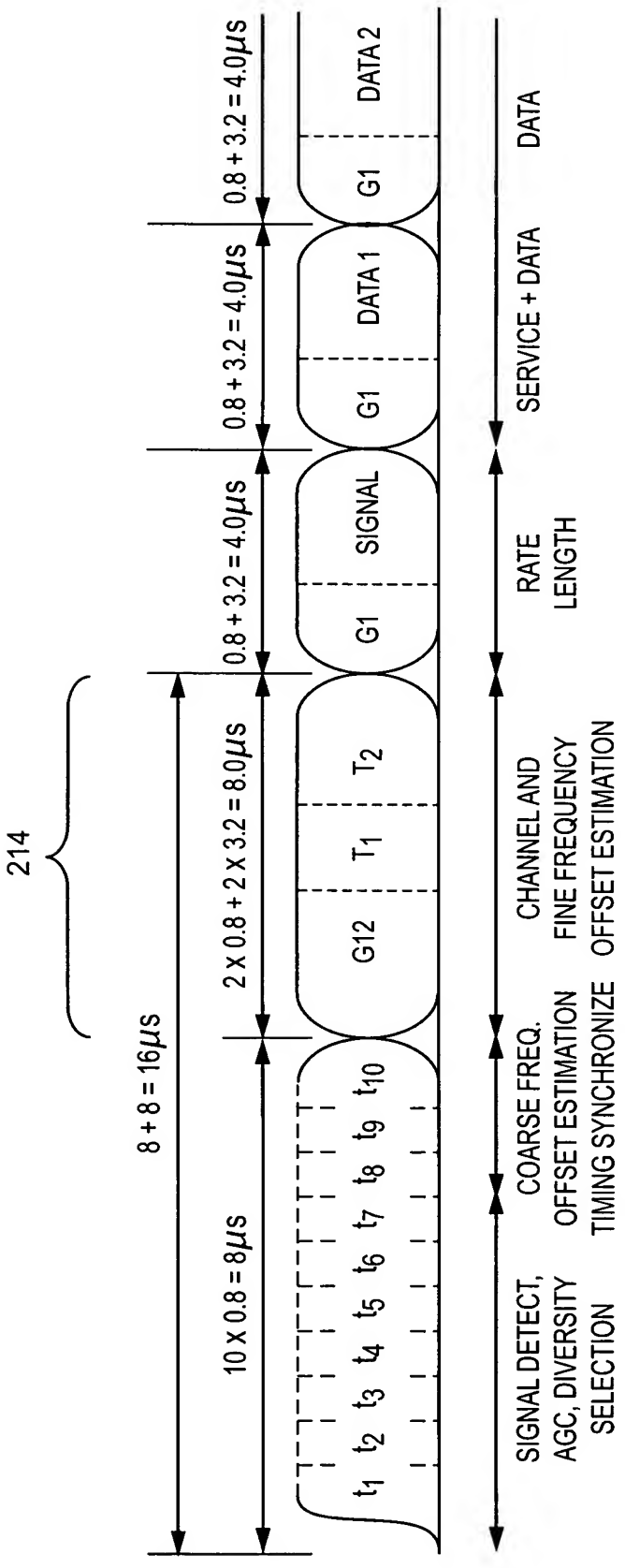
214
8 + 8 = 16μs
10 x 0.8 = 8μs
2 x 0.8 + 2 x 3.2 = 8.0μs
0.8 + 3.2 = 4.0μs
0.8 + 3.2 = 4.0μs
0.8 + 3.2 = 4.0μs
0.8 + 3.2 = 4.0μs
t1 t2 t3 t4 t5 t6 t7 t8 t9 t10
G12
T1
T2
G1
SIGNAL
G1
DATA 1
G1
DATA 2
SIGNAL DETECT, AGC, DIVERSITY SELECTION
COARSE FREQ. OFFSET ESTIMATION TIMING SYNCHRONIZE
CHANNEL AND FINE FREQUENCY OFFSET ESTIMATION
RATE
LENGTH
SERVICE + DATA
DATA

FIG. 8

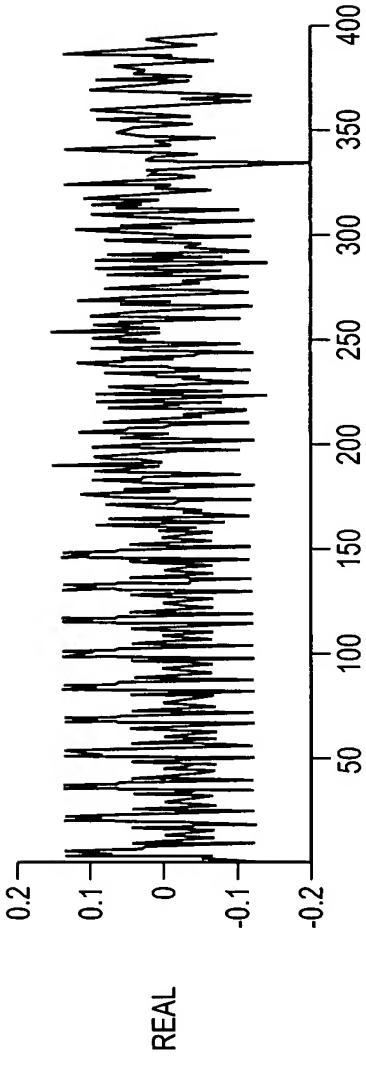
REAL
0.2
0.1
0
-0.1
-0.2
50
100
150
200
250
300
350
400

FIG. 9A

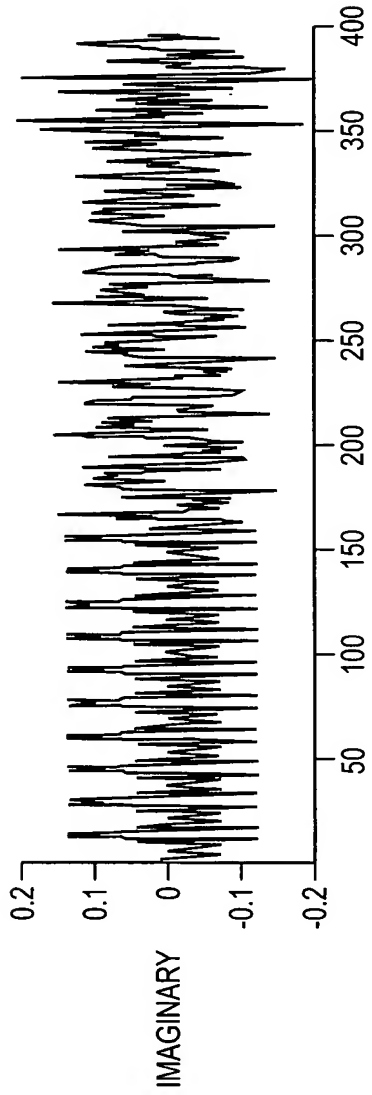
IMAGINARY
0.2
0.1
0
-0.1
-0.2
50
100
150
200
250
300
350
400

FIG. 9B

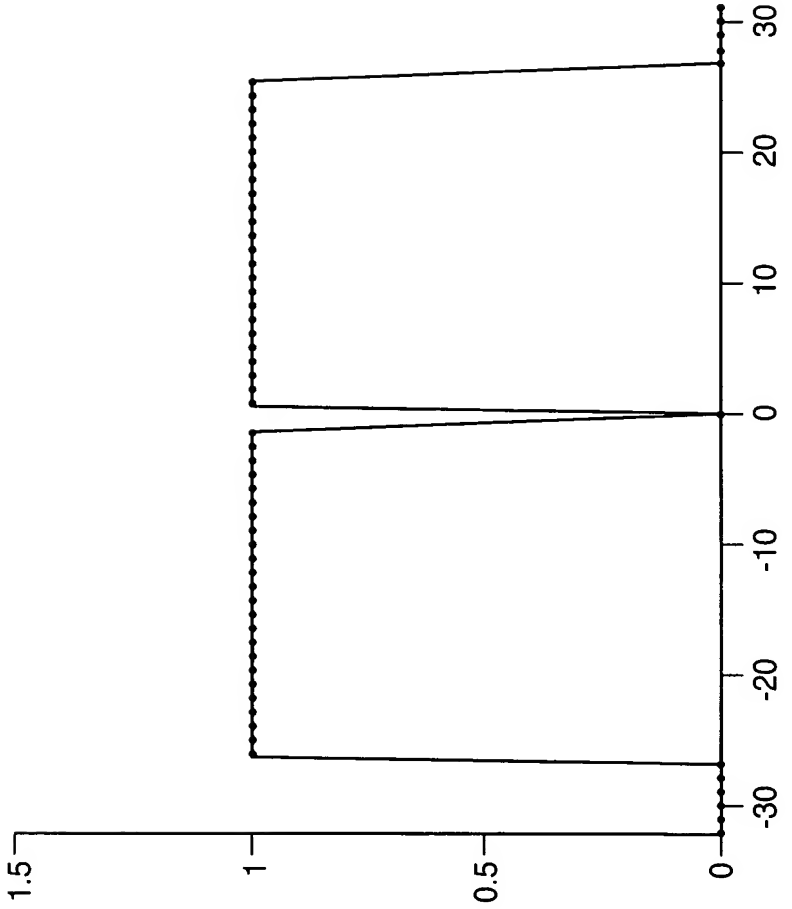

FIG. 10

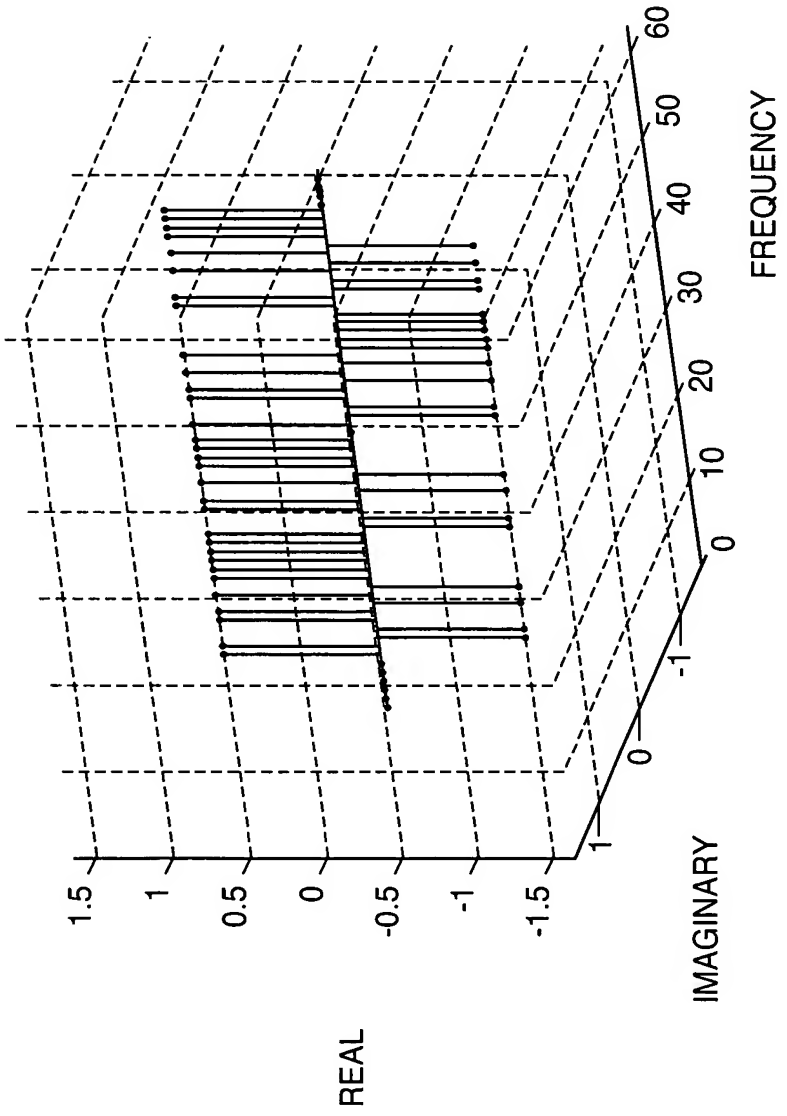

FIG. 11

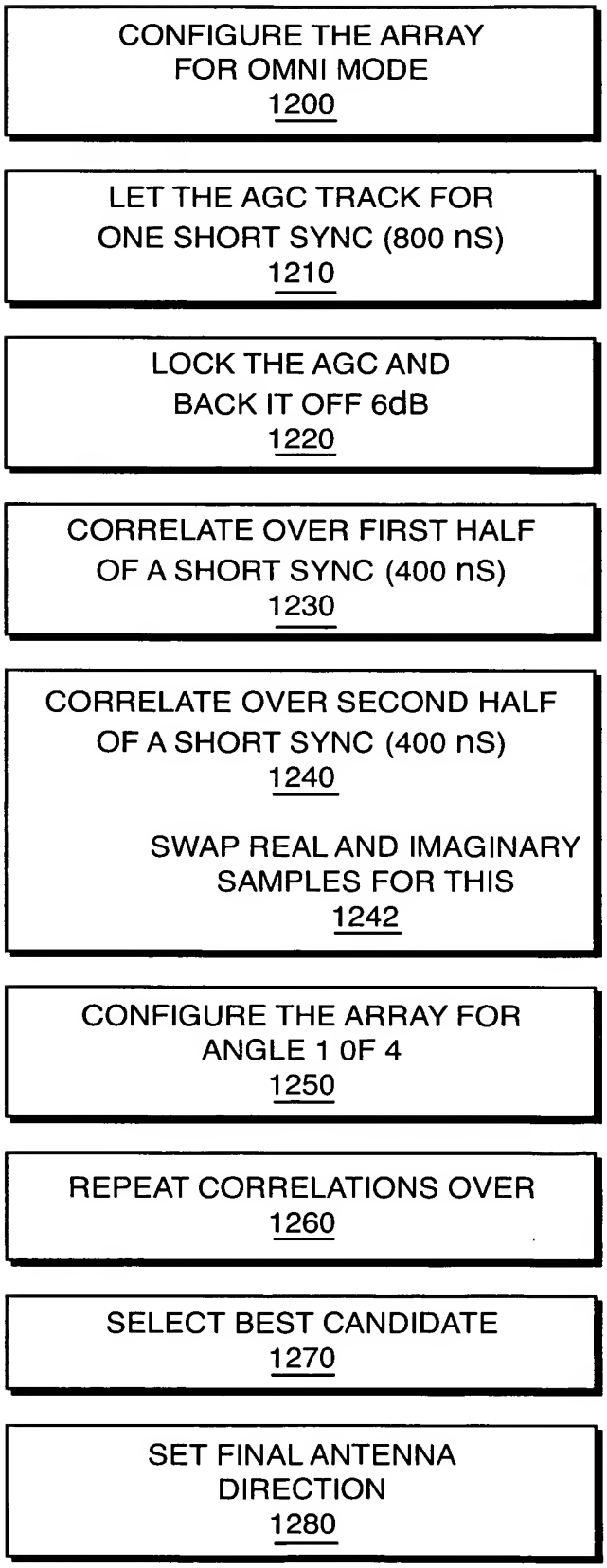
CONFIGURE THE ARRAY FOR OMNI MODE
1200
LET THE AGC TRACK FOR ONE SHORT SYNC (800 nS)
1210
LOCK THE AGC AND BACK IT OFF 6dB
1220
CORRELATE OVER FIRST HALF OF A SHORT SYNC (400 nS)
1230
CORRELATE OVER SECOND HALF OF A SHORT SYNC (400 nS)
1240
SWAP REAL AND IMAGINARY SAMPLES FOR THIS
1242
CONFIGURE THE ARRAY FOR ANGLE 1 0F 4
1250
REPEAT CORRELATIONS OVER
1260
SELECT BEST CANDIDATE
1270
SET FINAL ANTENNA DIRECTION
1280

FIG. 12

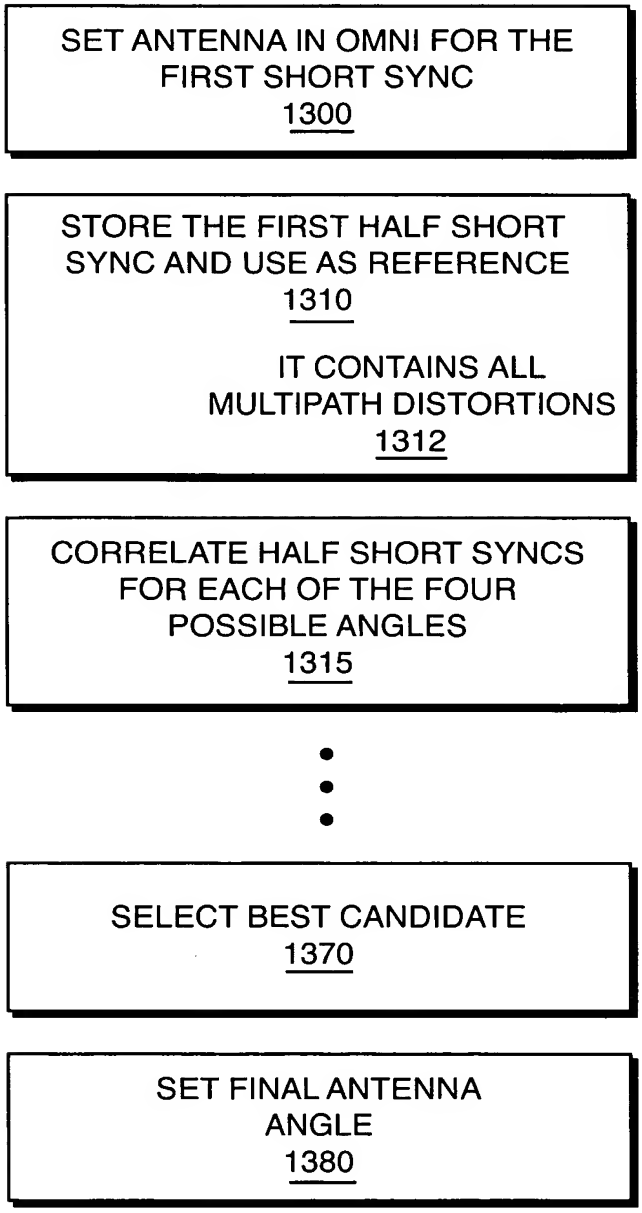
SET ANTENNA IN OMNI FOR THE FIRST SHORT SYNC
1300
STORE THE FIRST HALF SHORT SYNC AND USE AS REFERENCE
1310
IT CONTAINS ALL MULTIPATH DISTORTIONS
1312
CORRELATE HALF SHORT SYNCS FOR EACH OF THE FOUR POSSIBLE ANGLES
1315
SELECT BEST CANDIDATE
1370
SET FINAL ANTENNA ANGLE
1380

FIG. 13

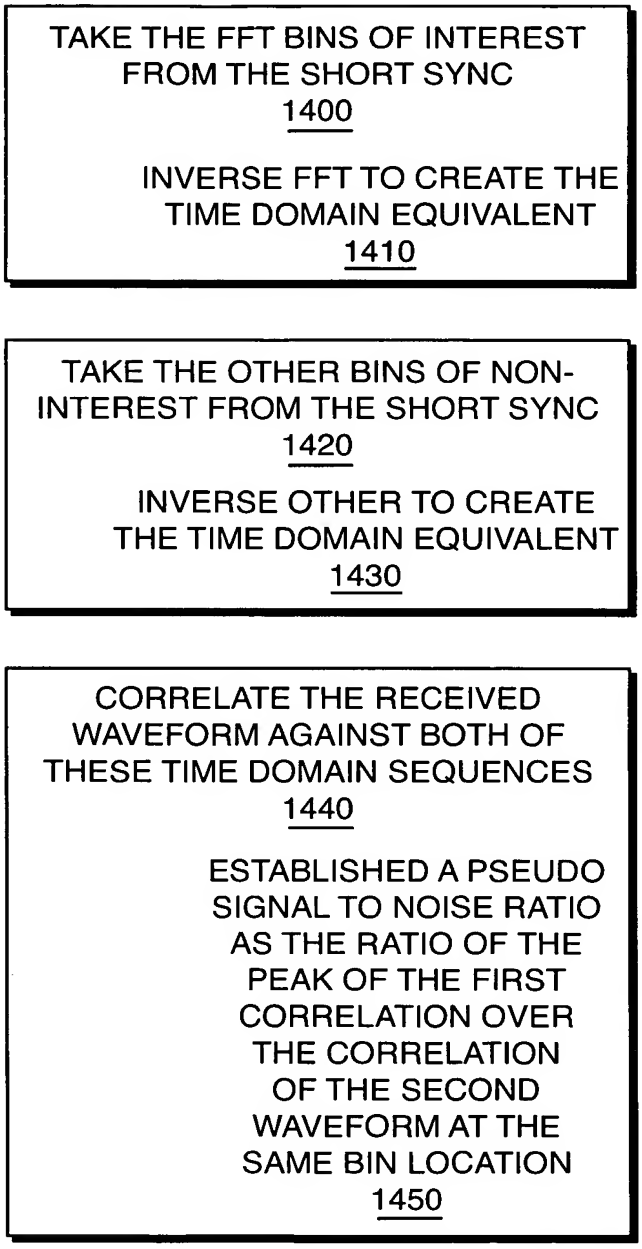
TAKE THE FFT BINS OF INTEREST FROM THE SHORT SYNC
1400
INVERSE FFT TO CREATE THE TIME DOMAIN EQUIVALENT
1410
TAKE THE OTHER BINS OF NON-INTEREST FROM THE SHORT SYNC
1420
INVERSE OTHER TO CREATE THE TIME DOMAIN EQUIVALENT
1430
CORRELATE THE RECEIVED WAVEFORM AGAINST BOTH OF THESE TIME DOMAIN SEQUENCES
1440
ESTABLISHED A PSEUDO SIGNAL TO NOISE RATIO AS THE RATIO OF THE PEAK OF THE FIRST CORRELATION OVER THE CORRELATION OF THE SECOND WAVEFORM AT THE SAME BIN LOCATION
1450

FIG. 14